



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/735,871	12/16/2003	Leonardo Baldassarre	3816-56	5462
30024	7590	07/06/2005		
NIXON & VANDERHYE P.C. 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER VERDIER, CHRISTOPHER M	
			ART UNIT 3745	PAPER NUMBER

DATE MAILED: 07/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/735,871	BALDASSARRE ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	Christopher Verdier	3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1) Responsive to communication(s) filed on 04 May 2005.  
 2a) This action is **FINAL**.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4) Claim(s) 11 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 11 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 5-4-05 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \*    c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

Art Unit: 3745

Applicant's Amendment dated May 4, 2005 has been carefully considered but is non-persuasive. Claim 11 is pending. The new declaration is acceptable. The drawings and specification have been amended to overcome the objection to the drawings set forth in the first Office action. The specification has been amended to correct the informalities set forth in the first Office action. Correction of the above matters is noted with appreciation.

Applicant's argument that the term "blading with blades" as it appeared in original claim 1 is definite, because the blading refers to the entirety of the blades of the diffuser and the term "blades" refers to the individual blades which comprise the blading of the diffuser (page 5, fifth paragraph of Applicant's Remarks dated May 4, 2005) is persuasive, as it applies to new claim 11.

Applicant's argument that the references to Bandukwalla 4,850,795, Bandukwalla 4,824,325, Matsuni 6,607,353, the article "A Study on Centrifugal Impeller and Diffuser Flow", Seleznev 3,973,872, and Nishida 5,228,832 no longer apply under 35 USC 102 to claim 11, is agreed with.

Concerning Kobayashi 4,938,661, Applicant has argued that the examiner has referred to a ratio between a diameter of the intake edge of the blading and the outer diameter of the impeller in a range of 1.03 to 1.1, while apparently utilizing values given in Table 1 for the fourth stage to arrive at a value of 1.03 (77.5/75), and apparently relying on the first stage ratio 93.5/85 to arrive at the other end value of the ratio. Applicant has further argued that the claimed

range of 1.04-1.14 set forth in claim 11 is not supplied by Kobayashi in a blade of a single stage, because the ratio given by the examiner applies to blades of different stages. Applicant has similarly argued that claim 11 requires a ratio between the diameter of the outlet edge of the blading and the outer diameter of the impeller to lie in a range between 1.25 and 1.35, while the examiner states that the ranges of this ratio in Kobayashi are 1.26 and 1.31, and that these ratios are likewise for the blades of different stages of the compressor as set forth in Table 1 of Kobayashi, and are not applicable to a single set of blades, but rather apply to blades of various stages. These arguments are not persuasive. The exemplary ratios referred to in Kobayashi by the examiner were listed as various examples of ratios that fall within the claimed range. The examiner is not relying upon different stages to arrive at the claimed ratios, but rather listed several examples of ratios that fall within the claimed range. As set forth in MPEP 2131.03, a specific example in the prior art which is within a claimed range anticipates the claimed range. As set forth therein, ““[W]hen, as by a recitation of ranges or otherwise, a claim covers several compositions, the claim is anticipated’ if one of them is in the prior art.” *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (citing *In re Petering*, 301 F.2d 676, 682, 133 USPQ 275, 280 (CCPA 1962)) (emphasis in original) (Claims to titanium (Ti) alloy with 0.6-0.9% nickel (Ni) and 0.2-0.4% molybdenum (Mo) were held anticipated by a graph in a Russian article on Ti-Mo-Ni alloys because the graph contained an actual data point corresponding to a Ti alloy containing 0.25% Mo and 0.75% Ni and this composition was within the claimed range of compositions.”) That is, Kobayashi does not need to disclose the entire claimed ratio range of 1.04 to 1.14 for the ratio of the inlet edge of the blading to the outer diameter of the impeller and the entire range of 1.25 to 1.35 for the ratio of the outlet edge of the

blading to the outer diameter of the impeller, but only needs to disclose a single ratio value which falls within the claimed range in order to meet the claimed range of ratios. As set forth later below, Kobayashi discloses, for the first stage impeller, a ratio of 1.1 for the ratio of the inlet edge of the blading to the outer diameter of the impeller, and a ratio of 1.265 (107.5/85) for the ratio of the outlet edge of the blading to the outer diameter of the impeller. Note also that newly added claim 11 combines the features of original claims 4 and 5 into claim 11, which were not previously claimed together.

#### *Examiner's Suggestions to Claim Language*

The following are suggestions to improve the clarity and precision of claims:

In claim 11, line 9, "said latter" may be changed to --this --.

In claim 11, lines 11 and 13, "the latter" may be changed to --this --.

#### *Claim Objections*

Claim 11 is objected to because of the following informalities: Appropriate correction is required.

In claim 11, line 4, "cord" should be changed to -- chord --.

In claim 11, line 9, "a" (last occurrence) should be changed to -- the --.

In claim 11, line 10, "an" (first occurrence) should be changed to -- the --.

In claim 11, line 12, "an" (second occurrence) should be changed to -- the --.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi 4,938,661 in view of the article "A Study on Centrifugal Impeller and Diffuser Flow". Kobayashi (figures 1-2 and Table 1) discloses a diffuser 8 for a centrifugal compressor 3 substantially as claimed, including an impeller 4 and diffuser blading 8d including plural blades in a single stage, a ratio of the diameter of the intake edge of the blading and an outer diameter of the impeller being 1.1 (see Table 1, first stage,  $r/R$ ), and a ratio of the diameter of the outlet edge of the blading and the outer diameter of the impeller being 1.265 (see Table 1, first stage,  $r'/R$ , 107.5/85). The blading has a strength which is provided by the ratio between a pitch of each

blade and a chord of each blade, which is inherently provided by the ratio  $\Pi D_p \text{ in}/Z$ . However, Kobayashi does not disclose that the strength is in a range between 0.5 and 1 including end values of the range, and does not disclose that the deflection of the blades which is the angle of displacement of a tangent line at the outlet of each blade relative to a tangent line at the intake of the blade lying in a range between an angle of 0 degrees and an angle of 10 degrees including end values of this range.

The article "A Study on Centrifugal Impeller and Diffuser Flow" (figures 2-3, 12, and 15) shows a diffuser for a centrifugal compressor having an unnumbered diffuser with a strength  $(y/t)$  that is 0.5, with the diffuser having unnumbered straight blades such that the deflection of the blades which is the angle of displacement of a tangent line at the outlet of each blade relative to a tangent line at the intake of the blade is 0 degrees, for the purpose of providing an efficiency-optimized diffuser and compressor stage.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to form the diffuser of Kobayashi such that the blading strength is 0.5 and the deflection of the blades which is the angle of displacement of a tangent line at the outlet of each blade relative to a tangent line at the intake of the blade lying is 0 degrees, as taught by the article "A Study on Centrifugal Impeller and Diffuser Flow", for the purpose of providing an efficiency-optimized diffuser and compressor stage.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

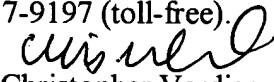
A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher Verdier whose telephone number is (571) 272-4824. The examiner can normally be reached on Monday-Friday from 10:00-6:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward K. Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

C.V.  
July 1, 2005

  
Christopher Verdier  
Primary Examiner  
Art Unit 3745